Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

StoBrick & StoCera



Registration number:	EPD-Kiwa-EE-314325-EN
Issue date:	23-09-2026
Valid until:	23-09-2031
Declaration owner:	Sto SE & Co. KGaA
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

StoBrick & StoCera

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-314325-EN

1.3 VALIDITY

Issue date: 23-09-2026

Valid until: 23-09-2031

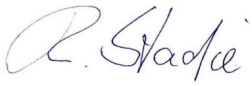
1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
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13355 Berlin
DE



Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Sto SE & Co. KGaA

Address: Ehrenbachstraße 1, D-79780 Stühlingen, Germany

E-mail: infoservice@sto.com

Website: https://www.sto.com

Production location: Ströher

Address production location: Ströherstraße 2–10, 35683 Dillenburg, Germany

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

☐ Internal ☒ External



Vijay Thakur, Vijay Thakur

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Institut Bauen und Umwelt e. V., PCR Part B: Requirements on the EPD for ceramic tiles and panels, version 11 (01.08.2024)

Kiwa-EE GPI R.4.0 Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, Program EE 1201 (18.12.2025)

Kiwa-EE GPI R.4.0 Annex B1 Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, Program EE 1203 (18.12.2025)

1 General information

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.20f (20260507)

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'StoBrick & StoCera ' with the calculation identifier ReTHiNK-214325.

2 Product

2.1 PRODUCT DESCRIPTION

Ströher in Dillenburg manufactures clinker brick slips, façade ceramics and façade bricks using an extrusion process as ceramic cladding for exterior and interior façades in accordance with DIN EN 14411:2012. The products can be used as cladding on external thermal insulation composite systems, ventilated façades and solid substrates. In addition, Ströher uses this production process to manufacture floor and wall tiles, which are used in both external and internal applications on terraces, balconies, living areas and in industrial settings. All ceramic tiles & brick slips are available in various formats and colours. To account for this variability, this life cycle assessment calculates an average ceramic tiles & brick slips product, weighing 18 kg/m², including glaze.

Products produced by Ströher and considered in this EPD are marketed and sold by Sto SE & Co. KGaA under the name StoBrick & StoCera. The results of this EPD can be extrapolated linearly to account for project specific values for the following products:

StoBrick 100 - 999

StoBrick 3000 - 3999

StoBrick 4000 - 4999

StoCera 2000

StoBrick & StoCera consists of the following base materials.

Raw material	Weight (%)
Clay	≥ 95
Glaze	≤ 5

The composition of the glaze is explained in detail in the chapter Estimates & Assumptions.

The products are available with brick, natural-stone, concrete and ceramic surface appearances.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration EN 14411:2012 ceramic tiles and the CE-marking. For the application and use the respective national provisions apply.

The UN CPC Code for the declared product group is: 37370 Ceramic flags and paving, hearth or wall tiles; ceramic mosaic cubes and the like.

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

StoBrick & StoCera can be applied on exterior and interior façades as well as cladding on external thermal insulation composite systems, ventilated façades and solid substrates.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The length of the service life highly depends on the installation quality. If installed correctly, the service life of StoBrick & StoCera can reach the life span of the building. The Sustainable Building Assessment System BNB specifies the service life of a mineral brick slip as at least 50 years (Code: 335.511.25). The service life is estimated to be between 80 and 100 years by the manufacturer, depending on climate and maintenance.

The use phase is not declared in this EPD, therefore the reference service life according to ISO 15686 is not reported.

USED RSL (YR) IN THIS LCA CALCULATION:

50

2.4 TECHNICAL DATA

The technical data varies between products and applications and should therefore be checked on a product and project specific basis. The Technical Data Sheet can be found on www.sto.de . The harmonised standard is EN 14411:2012.

Criterion	Standard/ test specification	Class / Value
Reaction to fire	EN 14411:2012	A1 or A1 fl depending on application
Maximum pore radius		> 0.2 µm
Pore volume		≥ 20 mm³/g
Water absorption acc. to EN ISO 10545-3:	EN ISO 10545-3	3 % ≤ x ≤ 6 % or ≤ 3 %

2 Product

Breaking strength (depending on tile thickness)	EN ISO 10545-4	< 7.5 mm min. 600 N ≥ 7.5 mm min. 950 N
Flexural tensile strength (average minimum)	EN ISO 10545-4	min. 20 N/mm²
Flexural tensile strength (individual minimum)	EN ISO 10545-4	min. 18 N/mm²

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to:

EN 14411-2012-12, Ceramic tiles - Definitions, classification, characteristics, evaluation of conformity and marking

Voluntary data: source, date, title (not part of CE marking):

EN ISO 10545-3:2018-06, Determination of water absorption, apparent porosity, apparent relative density and bulk density

EN ISO 10545-4:2019-02, Determination of modulus of rupture and breaking strength

2.5 SUBSTANCES OF VERY HIGH CONCERN

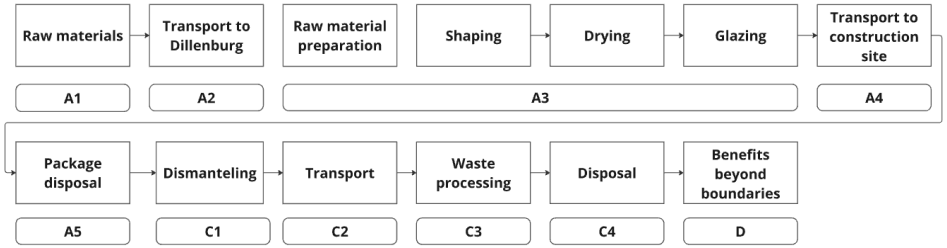
The product / At least one partial product contains substances from the ECHA list of candidates of substances of very high concern (SVHC) (dated 04 February 2026) exceeding 0.1 percentage by mass: **no**

The product / At least one partial product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1% by mass in at least one partial product: **no**

Biocidal products were added to this construction product or it has been treated with biocidal products (this then concerns a treated product as defined by the Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products.): **no**

2.6 DESCRIPTION OF THE PRODUCTION PROCESS

The manufacturing of StoBrick & StoCera involves several stages, including raw material preparation, shaping, drying, glazing when required, and firing the tile bodies. The main raw material used is clay, which is delivered by suppliers located near the production plant. The tiles are shaped, cut to the desired format and dried. Thereafter, glaze can be applied and the product is fired. In a last step, the finished tiles are sorted and packed for transportation to the customer.



2.7 CONSTRUCTION DESCRIPTION

StoBrick & StoCera can be applied on a variety of substrates. The substrate in general should be firm, dry and clean. StoBrick & StoCera can be applied with a mineral glue and a pointing mortar. Specific information on the application and handling of the product are described in detail in the relevant technical product documentation. Offcuts while installing the product are omitted, since there are large differences in occurrence depending on the project and product.

3 Calculation rules

3.1 DECLARED UNIT

1 m²

The declared unit is 1 m² of StoBrick & StoCera. The scope of this LCA is cradle to gate with options A4 and A5, modules C1-C4 and module D. The thickness is 0.01 m with a gross density of 1800 kg/m³.

Reference unit: m2

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	m2
Weight per reference unit	18.000	kg
Conversion factor to 1 kg	0.055556	m2

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle-to-gate with options, modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = Deconstruction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative of StoBrick & StoCera produced by Ströher in Dillenburg, Germany. The results of this EPD are representative of the European Union. The scenarios included in this life cycle analysis are currently in use and are representative of one likely scenario.

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)

The production stage consists of the extraction of raw materials, transportation of the raw materials, processing the raw materials into materials and the production of the product.

3 Calculation rules

The required energy for production, ancillary materials, packaging materials and production emissions are included. All substantial raw materials and types of energy during production are included. Raw materials added to the product in very small amounts (less than 1%) are not included. These cut-off limits do not apply to hazardous materials or substances.

Construction process stage (A4-A5)

Module A4 accounts for the transportation of 18 kg StoBrick & StoCera over 500 km. Module A5 accounts for the waste treatment of the product packaging and does not include product waste from the installation of the bricks into the building, due to a high variability of product variations. The product is generally applied manually, therefore no energy is required during the installation process

It is advised to add the specific values for adhesive and tile grout depending on the application and mortar used.

End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass. The waste scenario is declared to be 30 % landfill and 70 % recycling in accordance with the PCR.

Benefits and loads beyond the system boundary (Module D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

Excluded processes

Following processes has not been taken into account in this life cycle analysis:

- The manufacture of equipment used in production, buildings or any other capital goods;
- The transportation of personnel to the production plant;
- The transportation of personnel within the production plant;
- Research and development activities;

3.6 ALLOCATION

No allocation takes place during production. This LCA complies with the principle of modularity. There are no co-products that have to be taken into account. The producer of the declared product is under regulation from national authorities and follows the polluter pays principle.

3.7 DATA COLLECTION & REFERENCE PERIOD

This EPD project was carried out in January and February 2026. The reference period for the primary data is January to December 2025.

3.8 ESTIMATES AND ASSUMPTIONS

Datasets that are not available in ecoinvent were substituted with a material similar in chemical nature, production and environmental impact. Therefore, no cut off criteria according to EN 15804+A2. has been applied.

In accordance with the PCR, a default end-of-life scenario of 70% recycling and 30% landfill was applied. This default scenario is intended to reflect the waste-management assumptions defined by the PCR and is not based on product-specific end-of-life data.

No waste is accounted for at the construction site (EPD-BKF-20220184-ICG1-EN). If a tile needs to be cut to a specific format, the second half can be reused at another location. An assumption regarding construction losses can still be made if the declared environmental results from A1-A3, A4 and C and D are multiplied by a cut-off/breakage rate (Example: a 3% cut-off/breakage rate gives rise to a factor of 1.03 x environmental impact).

The declared products can be applied manually, therefore no additional energy is needed in module A5.

While the exact composition of the glaze may vary, it can be approximated by an average composition, which has been proposed by the German association “Bundesverband Keramische Fliesen e.V ” (EPD-BKF-20220184-ICG1-EN) and is stated in the table below.

Components	Mass percentages
Glass frites	60 %
Aggregates:	
Aluminium oxide Al2O3	8 %

3 Calculation rules

Iron oxide Fe2O3	8 %
Lime CaO	8 %
Zinc oxide ZnO	8 %
Zirconium oxide ZrO2	8 %
Total	100 %

3.9 DATA QUALITY

Datasets from ecoinvent 3.9.1 (2022) has been used for calculation with R<think. The ecoinvent data therefore complies with the requirements of EN 15804 (background data not older than 10 years).

Data concerning production has been gathered from the Production Management System used at the production site, therefore the technical representativity is considered very good in terms of accuracy for the calculation period and the declared product.

Table E.2 in Annex E from EN 15804+A2 has been used to assess the data quality of relevant data in the table below.

Quality requirement	Specific requirement	Data quality level	Notes
Time related coverage	Age of data and minimum time period for data collection.	The collected data is from the year 2025. The temporal representativeness is less than 3 years	good
Geographical coverage	Upstream: Unit process for raw material is collected for geographic region	Supplier data was collected and considered geographically in the model.	good
	Core: Unit process for production should represent the real site.	Specific data from the corresponding production site were used from the previous year.	very good
	Downstream: End-of-life disposal should represent the region of disposal	The end-of-life scenario is declared according to the PCR for a bigger region (EU). Individual countries might deviate.	fair
Technical representativeness	Qualitative assessment of the degree to which the data set reflects the true population of interest (technology)	The specific data on the manufacture of the declared product are provided by the manufacturer. They were determined on the actual systems and processes used for production.	very good

No data of poor or very poor quality has been used for either time, geographical or technological representativeness.

The dataset (ei3.9.1) Gas, natural gas (incl. emissions) (31.65MJ/Nm³) might account for more than 30 % of the impact of a core indicator.

All relevant process specific data was gathered during data collection. The data and scenarios used are representative of the European Union. The figures shown in this report are from January to December 2025. The data from the production site as well as the used scenarios are chosen in accordance with EN 15804.

3.10 POWER MIX

Data has been collected at the production site in Dillenburg. The energy used consists of 100% hydropower (market based approach) and covers the foreground process in Dillenburg. The electricity supplier is bound by state regulations in Germany for electricity labelling. The electricity labelling indicates 100 % renewable energy from hydropower. Hydropower is calculated with an environmental impact of 0.041 kg CO2-eq/kWh.

4 Scenarios and additional technical information

4.1 TRANSPORT TO CONSTRUCTION SITE (A4)

For the transport from production place to assembly/user, the following scenario is assumed for module A4 of this EPD.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck) 16-32t, EURO6 | market for (EU)
Fuel type and consumption of vehicle	not available
Distance	500 km
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.2 ASSEMBLY (A5)

The following information describes the scenarios for flows entering the system and flows leaving the system at module A5.

FLOWS ENTERING THE SYSTEM

There are no significant environment impacts as a result of materials or energy used in the construction stage (A5).

FLOWS LEAVING THE SYSTEM

The following output flows leaving the system at module A5 are assumed.

Description	Value	Unit
Output materials as result of loss during construction	0	%
Output materials as result of waste processing of materials used for installation/assembly at the building site	0.000	kg
Output materials as result of waste processing of used packaging	0.360	kg

4.3 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

4.4 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

4 Scenarios and additional technical information

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) treatment of mixed construction waste (EU)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.5 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables.
First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) treatment of mixed construction waste (EU)	EU	0	30	0	70	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) treatment of mixed construction waste (EU)	0.000	5.400	0.000	12.600	0.000
Total	**0.000**	**5.400**	**0.000**	**12.600**	**0.000**

4.6 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

4 Scenarios and additional technical information

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) treatment of mixed construction waste (EU)	12.600	0.000
Total	**12.600**	**0.000**

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER M2

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	6.38E-1	1.83E-1	3.09E+0	3.91E+0	1.70E+0	6.14E-1	0.00E+0	1.74E-1	1.88E-2	3.28E-2	-6.52E-2
GWP-f	kg CO_2 eq.	6.36E-1	1.83E-1	3.64E+0	4.45E+0	1.70E+0	2.31E-2	0.00E+0	1.74E-1	1.87E-2	3.28E-2	-6.48E-2
GWP-b	kg CO_2 eq.	1.76E-3	4.31E-5	-5.51E-1	-5.50E-1	5.47E-4	5.91E-1	0.00E+0	5.66E-5	1.70E-5	1.43E-5	-1.69E-4
GWP-luluc	kg CO_2 eq.	7.30E-4	6.19E-5	6.41E-3	7.20E-3	8.37E-4	2.15E-5	0.00E+0	6.19E-4	4.22E-6	1.98E-5	-2.47E-4
ODP	kg CFC 11 eq.	9.33E-8	8.52E-9	1.53E-7	2.55E-7	3.69E-8	8.14E-10	0.00E+0	3.09E-9	4.21E-10	9.50E-10	-1.36E-9
AP	mol H+ eq.	5.02E-3	4.08E-4	4.56E-3	9.99E-3	3.71E-3	1.35E-4	0.00E+0	8.31E-4	1.18E-4	2.47E-4	-5.54E-4
EP-fw	kg P eq.	3.74E-5	1.37E-6	4.33E-5	8.20E-5	1.38E-5	3.22E-7	0.00E+0	1.73E-6	3.71E-7	3.20E-7	-4.36E-6
EP-m	kg N eq.	9.68E-4	9.36E-5	1.84E-3	2.91E-3	9.13E-4	5.40E-5	0.00E+0	3.16E-4	5.01E-5	9.44E-5	-1.68E-4
EP-T	mol N eq.	1.14E-2	1.04E-3	1.50E-2	2.74E-2	9.50E-3	5.76E-4	0.00E+0	3.37E-3	5.49E-4	1.02E-3	-2.15E-3
POCP	kg NMVOC eq.	3.33E-3	6.00E-4	7.20E-3	1.11E-2	5.76E-3	1.94E-4	0.00E+0	1.15E-3	1.63E-4	3.54E-4	-5.82E-4
ADP-mm	kg Sb-eq.	5.50E-5	1.16E-6	6.81E-6	6.30E-5	5.54E-6	9.17E-8	0.00E+0	5.44E-7	7.59E-8	4.56E-8	-2.91E-7
ADP-f	MJ	7.99E+0	2.61E+0	5.01E+1	6.07E+1	2.41E+1	2.55E-1	0.00E+0	2.49E+0	2.56E-1	8.18E-1	-8.11E-1
WDP	m3 world eq.	6.39E-1	9.91E-3	2.59E-1	9.08E-1	1.13E-1	2.76E-3	0.00E+0	1.53E-2	1.53E-3	3.67E-2	-7.61E-1

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease incidence	5.24E-8	1.34E-8	4.14E-8	1.07E-7	1.26E-7	2.35E-9	0.00E+0	1.71E-8	2.87E-9	5.41E-9	-9.51E-9
IR	kBq U235 eq.	1.61E-2	2.45E-3	2.21E-2	4.07E-2	1.22E-2	3.08E-4	0.00E+0	9.70E-4	2.93E-4	2.16E-4	-1.63E-3
ETP-fw	CTUe	8.83E+0	5.75E-1	8.48E+0	1.79E+1	1.19E+1	3.40E-1	0.00E+0	1.84E+0	8.61E-2	3.84E-1	-3.57E-1
HTP-c	CTUh	1.19E-9	3.43E-11	9.67E-10	2.19E-9	7.73E-10	4.50E-11	0.00E+0	9.20E-11	5.95E-12	1.40E-11	-6.29E-11
HTP-nc	CTUh	4.30E-8	1.72E-9	1.18E-8	5.66E-8	1.71E-8	3.17E-10	0.00E+0	2.00E-9	1.20E-10	1.75E-10	-1.03E-9
SQP	Pt	1.51E+1	1.60E+0	1.63E+1	3.30E+1	1.46E+1	9.74E-2	0.00E+0	1.96E+0	3.45E-2	1.62E+0	-2.20E+1

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality index (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

5 Results

ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	6.54E-1	4.24E-2	8.53E+0	9.23E+0	3.79E-1	9.29E-3	0.00E+0	3.52E-2	2.14E-2	6.92E-3	-3.90E+0
PERM	MJ	0.00E+0	0.00E+0	4.54E+0	4.54E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	6.54E-1	4.24E-2	1.31E+1	1.38E+1	3.79E-1	9.29E-3	0.00E+0	3.52E-2	2.14E-2	6.92E-3	-3.90E+0
PENRE	MJ	8.02E+0	2.78E+0	5.01E+1	6.09E+1	2.41E+1	2.55E-1	0.00E+0	2.49E+0	2.56E-1	8.18E-1	-8.11E-1
PENRM	MJ	0.00E+0	0.00E+0	9.26E-2	9.26E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	8.02E+0	2.78E+0	5.02E+1	6.10E+1	2.41E+1	2.55E-1	0.00E+0	2.49E+0	2.56E-1	8.18E-1	-8.11E-1
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	1.34E-2	3.24E-4	8.41E-3	2.22E-2	3.79E-3	1.30E-4	0.00E+0	6.40E-4	7.37E-5	8.82E-4	-1.78E-2

PERE=Use of renewable primary energy excluding renewable primary energy resources used as raw materials | **PERM**=Use of renewable primary energy resources used as raw materials | **PERT**=Total use of renewable primary energy resources | **PENRE**=Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials | **PENRM**=Use of non-renewable primary energy resources used as raw materials | **PENRT**=Total use of non-renewable primary energy resources | **SM**=Use of secondary material | **RSF**=Use of renewable secondary fuels | **NRSF**=Use of non-renewable secondary fuels | **FW**=Net use of fresh water

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	Kg	4.20E-5	1.64E-5	2.17E-4	2.76E-4	1.53E-4	1.56E-6	0.00E+0	1.59E-5	1.32E-6	4.33E-6	-3.75E-6
NHWD	Kg	1.60E-1	1.27E-1	2.55E-1	5.42E-1	1.20E+0	9.90E-2	0.00E+0	1.64E-1	3.84E-2	5.40E+0	-1.30E-2
RWD	Kg	1.15E-5	2.95E-6	1.81E-5	3.25E-5	7.92E-6	2.26E-7	0.00E+0	5.69E-7	2.47E-7	1.21E-7	-1.05E-6

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.70E-1	0.00E+0	0.00E+0	1.26E+1	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.59E-1
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.08E-1

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER M2

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per m2:

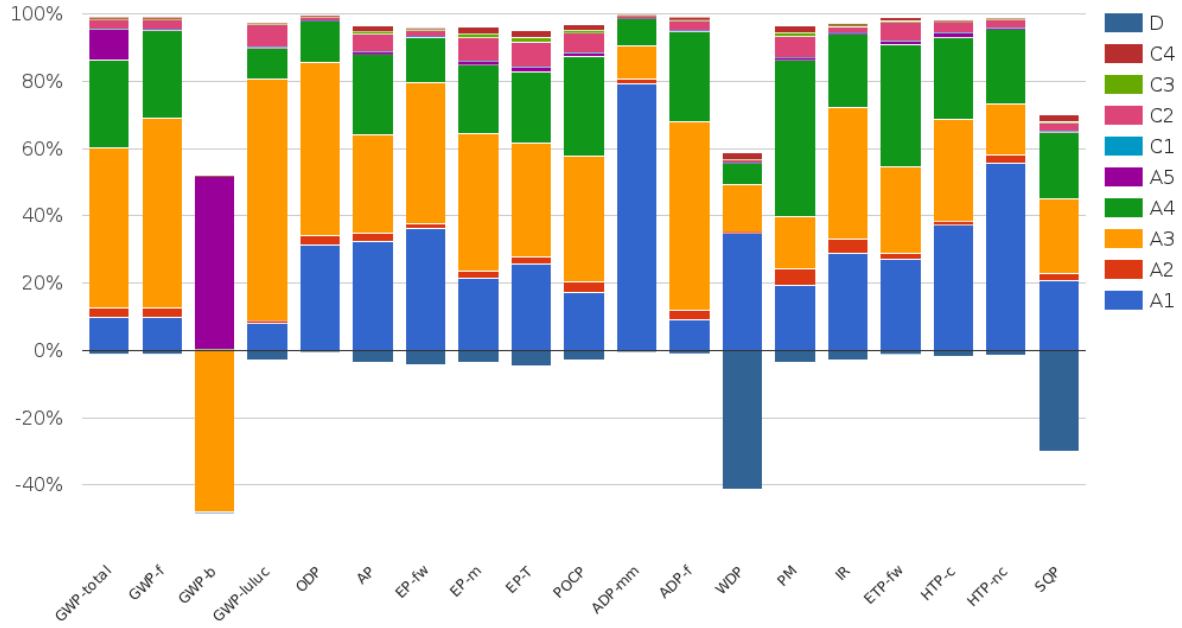
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.1604	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Packaging	0.588	kg CO2 (biogenic)

6 Interpretation of results



The figure above shows the impact of different life stages on the LCA results in accordance to their respective environmental impact indicator.

The impact of the production process (A3) for StoBrick & StoCera dominates the indicators GWP-total, GWP-f, GWP-luluc, ODP and ADP-f due to the energy intensive drying process. Module A1 dominates the indicators ADP-mm and HTP-nc due to the glaze. GWP-b is balanced between the production process and installation due to the balanced biogenic carbon content of the product packaging. The transport module A4 has a high impact on the indicators PM and POCP due to the assumed transport distance of 500 km to customers in Europe and the declared weight of the product. For the reported indicators, the absolute contributions from modules C1-C4 are lower than those from A1-A4, based on the declared scenarios. Module D reports negative values for WDP and SQP due to the modelled recycling substitution. Since an average product is calculated, the result might

6 Interpretation of results

vary depending on the amount of glaze used. The variation only accounts for Module A1, since the overall weight and the amount of energy used remain the same. Between a calculatory “best-case” scenario (0 % glaze) and a calculatory “worst-case” scenario (5 % glaze) a variability in result of around 10 % for Module A1 for the indicator GWP-total can be stated. The end-of-life scenario remains unchanged.

7 References

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PCR B Product category rules for building-related products and services, Part B: Requirements on the EPD for ceramic tiles and panels, version 11, 01.08.2024, Institut Bauen und Umwelt e. V., 2014

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ecoinvent 3.9.1: EN 15804+A1 indicators (CML-IA Baseline v3.09), EN 15804+A2 indicators (EF 3.1)

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EN ISO 10545-3:2018-06, Determination of water absorption, apparent porosity, apparent relative density and bulk density

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